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# Officer and Pilot Selection System in Turkish Air Force

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## Abstract

In contrast to expectations, with the pace of developing technology, the human factor has become one of the most important elements in the organizations. Especially, in complex systems, like aviation, the human factor is even more critical. The fact that the cause of 80% of flight accidents in the last 40 years is related to human factor underlines the importance of human factor in this area.

According to the current laws, the aim of the Turkish Air Force Academy (TAFA) is to produce pilot candidate officers. In other words, all officers are aimed to be trained as pilots. Therefore, the officer selection system and pilot selection system is organized in an integrated way. In order to accomplish this critical mission, Turkish Air Force that has always been conscious of the importance of human factor has already developed a complex and multi-staged selection system for Turkish Air Force Academy.

The first step of the system is national university entrance test. The election system also includes medical check-up, physical fitness test, various ability and personality tests, three different interviews. The candidates, who succeed to pass these stages, fly a propeller-training plane for 14 hours. At the end of this training, the successful candidates take basic military training. The candidates achieve to pass all the stages successfully can be a student in the Academy. In this paper, the details of this integrated selection system are introduced and the recent improvements in the system are explained.

## Introduction

Aviation technology has been rapidly improved since the first successful take off an engine powered aircraft, and developments in recent years accelerated to a large extent. The number of aircraft passengers only in the United States increased approximately 20 times from 2,532,000 in 1960 to 48,049,000 in 1996 (Air Carrier Profile, 1999). One of the most important concerns of this thriving aviation sector is to minimize aircraft accidents and provide flight safety. According to statistical data for the past 40 years, 80% of aircraft accidents

involved the human factor (Aircraft Accidents, 1998). The core of the human factor in aviation is pilot, and therefore pilot selection is the most crucial element.

Costs represent the important component of pilot selection process. An F-16 jet fighter costs approximately US\$ 22.5 million in 1997 (THK Maliyet Analizi Kitapçığı, 1997). The training of a pilot who is responsible for flying such an expensive piece of war effectively and safely costs approximately GBP 3,000,000 (Turnbull GJ, 1992). The selection of the personnel to fly such a costly device after a high-priced training is certainly critical.

According to the current laws, the aim of the Turkish Air Force Academy (TAFA) is to produce pilot candidate officers. In other words, all officers are aimed to be trained as pilots. Therefore, the officer selection and pilot selection systems are organized in an integrated way. So pilot selection system which is still very hard gets even more complicated. In order to accomplish this critical mission, Turkish Air Force that has always been conscious of the importance of human factor has already developed a complex and multi-staged selection system for Turkish Air Force Academy. In this paper, we will introduce these selection procedures. Firstly, a brief information about the history of selection process and Human Resources Selection and Management Center that organizes the student selections will be given. After that, the details of each selection phases will be explained.

## History

Turkish Air Force was built on 1st July 1911 and the first pilot candidates, Captain Feza and Lieutenant Kenan, were selected to be pilots by a special council. These candidates were sent to France to be trained as pilots. In this way, the pilot selection history in Turkish Air Force was started.

In the early days, a perfect pilot was defined as follows:

- To be healthy and to have perfect eyes,
- To be calm and to have good memory and attention,
- Not to speak in an exaggerated way,

- To be able to read map.

Undoubtedly, these characteristics have changed, while new planes and technologies have been developed. In those years, the main tools for selection were interviews, medical check-up, glider training and training flights. Only the candidates who could achieve all the stages could be accepted as a cadet (İKDM Tarihçesi, 1998).

In 1963, a new and important tool, intelligence test, was added into the selection system. In the same year physical fitness test was another important development for the pilot selection procedure.

In 1986, computerized pilot aptitude tests were integrated into the selection process. These tests, purchased from the British Royal Air Forces in 1986, assess the required flying aptitudes of the candidates. They have still been used in the current pilot selection system.

Up to 1982, student selection system was not organized by a special department. This duty was done by personnel chief of the Academy. However, in 1982, Enrolment Office was founded to organize and develop the student selection system. Finally, in 1991, this office was upgraded to Human Resources Selection and Management Center (HRSC) which is still organizing the student selections.

HRSC's main duty is to select the candidates who have high motivation and aptitude for being officer and pilot (İKDM Başkanlığı Görev Analizi, 1995). This center directly depends on Academy Commandant and it has three sub departments. These are public relations, interviews, and psychotechnic assessment.

The main goal of public relations is to give information to public and especially potential candidates, about Air Force Academy. In order to realize this goal, tours in the Academy are organized for the candidates or students of high schools. Moreover, posters and brochures that include information about Air Force and student selection system are delivered. These brochures are sent to all potential candidates. In addition to these, public relations are responsible for the TV programs and journal advertisements.

Interview department organizes three different interviews in order to select the fittest candidates. These interviews will be explained in the following sections. Another activity of interview department is to develop and find new interviewing techniques for selections.

Psychotechnic assessment department is responsible for assessment of the candidates with the help of the computerized aptitude tests. These tests are used to decide whether the candidate is appropriate to be a pilot. Surely, another duty of psychotechnic assessment department is to develop or provide new pilot aptitude tests.

Before getting into the details of selection procedures, it would be better to have a look at the student profile of Turkish Air Force Academy and the candidate sources.

### Student Profile of the Academy

In a complete personnel selection system, the profile of the desired personnel is one of the most important concepts.

The general objective of Academies is to produce regular officers who have had graduate level education according to the Service Academies Law and the Law of National Education. According to these laws, general profile of a regular officer is as follows:

- A mature personality and character that have been developed morally, physically and mentally,
- Acquired leadership qualities,
- Knowledge about military science, technical and social sciences,
- The ability to be a leader in the development of the Armed Forces according to the requirements of the age,
- The ability to follow the post graduate education and also the ability to comprehend the national and international problems in the light of Atatürk's principles.

The specific objective of the Air Force Academy is to produce pilot candidate regular officers who will be able to apply and improve the necessary tactical, technical and administrative activities. These officers are also expected to acquire basic orientation to perform further duties to match the current and future development pace of aviation and the Air Force (Air Force Missions and Objectives, 1999). Because of this special objective of TAFE, pilot aptitudes and aviation motivation must be added to the profile of an air officer.

An ideal TAFE cadet should have all these characteristics. The goal of all student selection procedures is to assess the candidates for these characteristics and to select the most appropriate ones.

## Candidate Sources

According to the current Academy law, the main candidate source of the Academy is military high schools. If the capacity of Air Force Academy can not be provided from the military high schools, high school graduates, male or female, can be candidates for TAFA.

Basically, all selection phases are processed in a standard manner, regardless of the source of candidates. However, there are some exceptions for this rule. All these details will be given in the following section.

## Selection Phases

There are many different forms of personnel selection phases in the organizations. However, most of the complete and successful selection systems can be formed in a standard way (Erdoğan İ., 1990). Figure 1 shows the graphic illustration of Air Force Academy Student Selection System according to that standard.

The candidates, who are successful in University Entrance Examination (UEE) and willing to attend the Academy, are required to fill an Application Form. If they are appropriate according to the Academy law, they are invited to the Academy for other selection phases. Firstly, initial medical check-up is applied to the candidates in order to determine the illness that can be inspected easily, for example baldness, stammer and etc. After that, tests and interviews are realized. At the last interview, a decision is given about the candidates, pass or fail. The successful candidates are sent to final medical check-up. The candidates who can take "Can Be A Military Cadet" report, go to Examination Flights. If candidate can also achieve this stage, they will take military training. And at the end, candidates who can pass all these stages can be cadets of the Academy.

As it was underlined that the selection phases for military high school oriented candidates and civilian high school candidates are not the same. Military high school candidates are exempt from some of the phases. Moreover, the sequence of the phases can be different. Table 1 shows the phases and sequence of the phases for each candidate sources.

Table 1. Selection phases for different candidate sources.

<b>Military High School</b>	<b>Civilian High School</b>
Application Form	UEE and Application Form
Final Medical Check-up	Initial Medical Check-up
Psychological Tests	Physical Fitness Test
Experimental Flights	Psychological Tests
	Interviews
	Experimental Flights
	Military Training

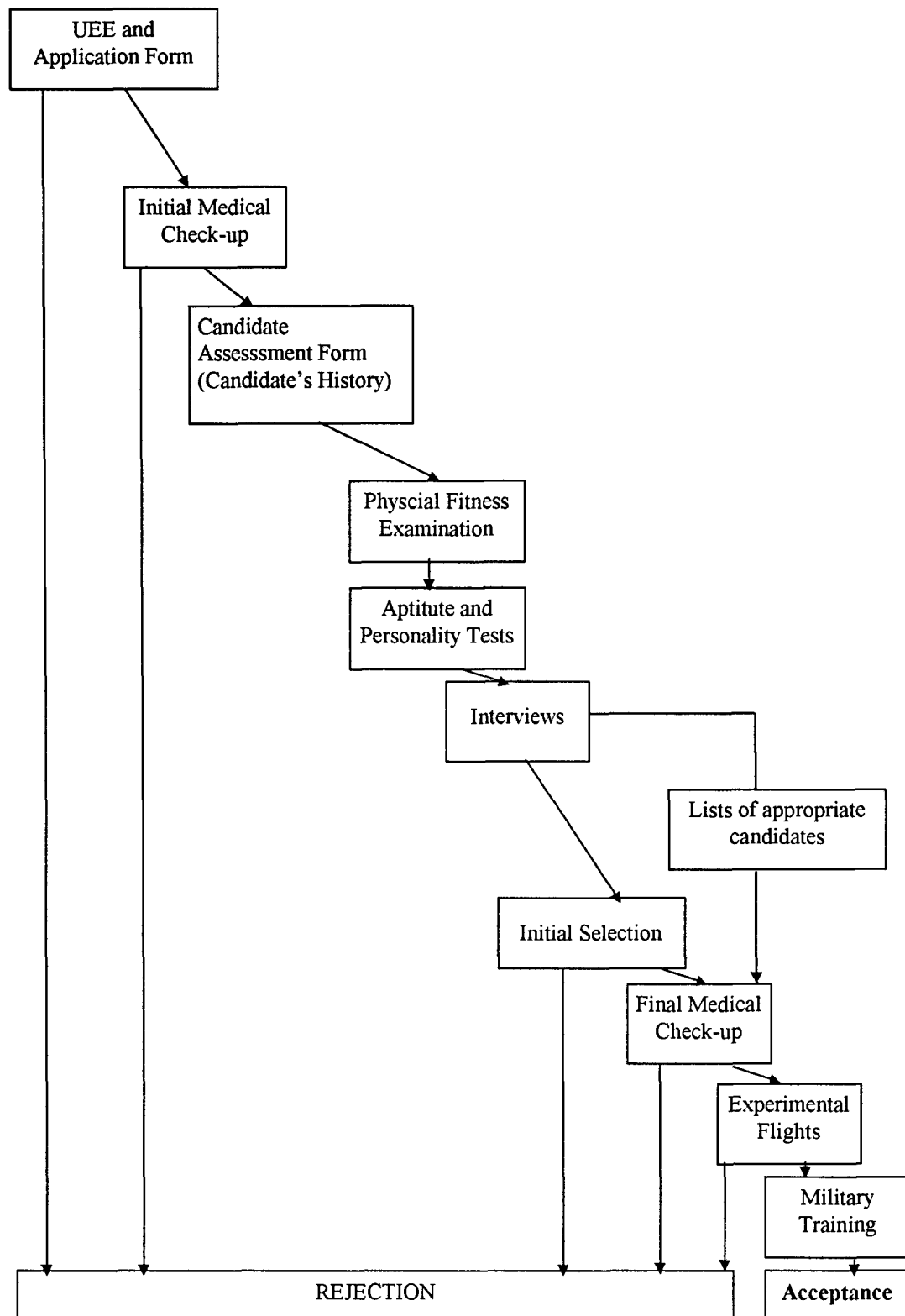


Figure 1. Turkish Air Force Academy Student Selection Procedure.

## University Entrance Examination (UEE) and Application Forms

There are many researches about the relationship between general ability and pilot aptitudes. Most of these show that the most significant measurement for predicting pilot training results is the general ability. In USAF, for example, AFOQT, which is aimed to measure general ability, is used to select air officers (AFOQT Information, 1998). In Turkey, UEE is used to measure general ability in TAFE student selection system.

In Turkish educational system, if a student wants to attend a university after high school graduation, he or she must take University Entrance Examination (UEE). More than 1.500.000 high school graduates take this exam each year. The students that want to attend TAFE must express his or her willingness, before the UEE.

The students who express willingness and whose points are higher than the point that has been announced by TAFE must fill initial an application form. In this form, we get information about the demographic characteristics of the candidate. In addition to this, a few more detailed pieces of information about the candidate are also included in this form, for example the height, weight etc. If all the conditions of the candidate are suitable for TAFE, s/he is invited to join TAFE for the selection phases.

### Initial Medical Check-up

The students, who can get the required point from the UEE, are invited to TAFE for other selection phases. The first selection phase in TAFE is initial medical check-up. The main aim of this check-up is basically economy and work saving. If there are some candidates who have disorders and abnormalities that can be inspected easily, determining their abnormalities earlier can save time and work.

In this medical check-up, candidates are examined to see if they have any disorders that can be easily determined, e.g. baldness, shortness, obesity, mouth disorders etc.

### Physical Fitness Test

The applicants that can pass initial check-up are tested with 400 meter run, long jump and push-ups. The candidates get a general grade according to their performances in these tests. Although there is no direct elimination at this test, the grades are taken into consideration at the last interview.

## Psychological Tests

There are three main tests which are used in the selection system. These are 16PF, Aircrew Aptitude Test (AAT) and Euro-NATO Portable Aptitude Test Battery (PORTABAT). The main aim of these tests is to measure personality and ability factors of the candidates. By the help of these measurements, comparison among candidates can be easier.

### 16 Personality Factors Questionnaire:

There are many researches indicating the relationship between personality and job performance. In most of the personnel selection systems, personality assessment is an important step. It is not so much different in aviation.

There are many tests that can assess the personality. However, only a few of them is frequently used in pilot selection system. The summary of the test which is used in pilot selection systems can be found in the report of Dolgin (Dolgin D.L., 1988). According to this report one of the most common personality test use for pilot selection is 16PF.

16PF is designed to make available information about an individual's standing on the majority of primary personality factors out of thirty or so covered by existing research on the total human sphere (Cattell R. B., Eber H. W., Tatsuoka M. M., 1970). In other words, this test is designed to model individual's whole personality characteristics with sixteen major factors. In TAFE student selection system, this test is used for getting information about candidate's personality before the interviews. The results of 16PF are sent to interview councils and these results are interpreted by the psychologist in the council. There is no direct elimination based on the results of 16PF.

### Aircrew Aptitude Test (AAT):

Since the formation of the first specific aptitude test battery for the pilots of the U.S. Air Force in between the years 1946-1947, these tests have become the most important instrument used for pilot selection. Although the use of the tests in the Air Force Academy selection system has been practiced for many years, computer-based aptitude tests are integrated in the system only in 1986. The test battery purchased from the British Royal Air Force is processed through validity and reliability studies, and reevaluated by the associated NATO work group to constitute the Turkish norms table (Bekmezci İ., 1999). There are three sub-tests in the battery: Sensory motor test, rapid perception test and instrument interpretation test. The raw scores

of the tests are converted to weighted scores following the Stanine (1-9) scoring system. To increase the predictive power of the battery, each test has been weighted differently. Raw scores are multiplied by the weights of each test, and the total battery score of the candidate is obtained by adding all scores up.

Up to 1998, the result of ATT is sent to interviews as data about candidates. After the correlation between test scores and pilot training results are constructed in 1998 (Bekmezci İ, Orman N.M., 1998), a new approach has been put into practice. The candidates get less than 80 points are eliminated.

### **Euro-NATO Portable Basic Attributes Test (PORTABAT):**

PORTABAT is a new test for measuring pilot aptitudes. It is produced as a result of Euro-NATO Aircrew Human Factors Working Group (AHFWG) meetings. This group is a multi-national group of appropriately qualified personnel and it is formed to advice and recommend to the Air Force Sub Group actions concerning aircrew selection, retention and crew resource management (Terms of Reference, 1997).

PORTABAT project was completed in 1992. However, the trials of this test were not successful. In fact, many countries could not run the test. After unsuccessful trials, the project was ended. However, in HRSC, it is upgraded and some modifications are realized. Modifications include network support, presentation of the test and scoring procedure. After the modifications, today, five subtests of PORTABAT can work on network environment without any error.

The initial results of this test are very successful. The correlation between AAT and PORTABAT is quite high. It shows the validity of PORTABAT. Although the results are encouraging, this test can not be accepted as completely valid. So this test is being used for only research purposes and the results of PORTABAT is not being used for direct elimination.

### **Interviews**

Interview is the oldest and most relied on tool in personnel selection systems. Although many researches show that there are more reliable tools for assessing the candidates, such as standardized tests, employers still prefer the interviews (Angus B., 1995). Interviews are the core part of TAFA student selection system. Three different types of interviews are applied to each candidate. These are

called psychological interview, group interview and decision making interview.

### **Psychological Interview:**

The first interview in the selection system is psychological interview. It can be classified as an unstructured interview. In this interview, each candidate is examined by an interview council. This council is composed of a wing commander, a faculty staff and a psychologist. They evaluate the candidate's all previous data (test results, psychical fitness test, autobiography etc.), behavior during the interview, willingness to be a pilot and an officer. At the end of the interview, the council gives a score between 1 and 4.

### **Group Interview:**

In this interview, there are five candidates and a council that is similar in psychological interview council. Council chairman gives a discussion topic for the candidates and council members observe the behavior of the candidates. In this interview, the interaction between candidates is evaluated. At the end, council gives a score between 1 and 4.

### **Decision Making Interview:**

Up to now, there has been no serious elimination in the system. The number of eliminated applicants in initial medical check-up and ATT is not so high actually. All the phases are mainly aimed to gather data about the candidates. In this interview, a decision about candidate is given, pass or fail, by the council. The council of this interview is very special. The members are School Commander, Chief of Staff, Dean of Academics and Commander of Cadet. Only the eligible candidates are allowed to take Final Medical Examination.

### **Final Medical Examination**

The candidates who can pass decision-making interview are sent to final medical examination. In this check-up, the candidates who can take "Can be military student and pilot" report from the medical commission can pass this phase.

### **Experimental Flights**

Although interview is known the oldest tool for personnel selection, there is another tool, which may be as old as interview, job-sampling test. In job-sampling test, candidates are required to operate in a standard sample of real job environment. Job sampling test is also being used in aviation. The underlying philosophy is that if a candidate can fly with an easy plane after a few

training hours, most probably, s/he has pilot aptitudes. To think the opposite is also true. If a candidate can not fly an easy plane, most probably, s/he can not fly a jet plane in the future. Another advantage of this in pilot selection is that candidates have a chance to get an idea about being pilot and flying. Alternatively, some NATO countries use simulations instead of real flying because of the standardization difficulties and costs of flights. There are some other countries never use experimental flights.

Experimental flying is the job-sampling environment of TAFE student selection system. In the flying camp, they take courses about flying and safety. After some courses in the class, candidates fly together with their instructor pilots. All training flights take 13 sorties at most. At the end of the 13<sup>th</sup> sortie, only the candidates who can fly solo in their 14<sup>th</sup> sortie can pass examination flight phase.

Although there are many critiques about experimental flights, costs, standardization problems, the role of instructor pilots etc.; TAFE prefer to select pilots by experimental flights. The common idea is that selecting pilot without any flying experiment may cause unwanted results, e.g. high attrition rate in pilot training, high rate of flight accidents.

Table 2. Pass rate of selection phases of civilian high school oriented candidates.

Selection Phase	Sex	
	Female (%)	Male (%)
UEE	2.5	2.5
Initial Medical Check-up	60	76
Tests (only for ATT)	100	88
Decision Making Interview	42	45
Final Medical Check-up	73	45
Experimental Flights	41	57
Basic Military Training	61	74
Total (except UEE)	4.6	5.7

Although the pass rates of the phases change according to sex of the candidates, it can be said that the most important phases are UEE, decision making interview, final medical check-up and experimental flights.

### Future Work

As not all systems are completely perfect, we try to find new methods to select perfect pilots and officers for the 21<sup>st</sup> century. The questions that will be discussed in the future are as follows:

### Basic Military Training

In modern personnel selection systems, the idea is to select candidate so that the organization and the candidate must satisfy. In order to achieve this aim, organization must introduce itself correctly and honestly.

Up to now, candidates of TAFE are examined for their different personality or ability characteristics. However, they have no chance to live real military life and to decide whether they can live in such a disciplinary environment. In basic military training, candidates have to live in TAFE for one month. In this period, they live hard and very boring military experiences. Candidates who do not obey the rules of the training fail in this phase. However, the main attrition cause is willingness. The candidates who decide not to continue in such an environment give a petition. This self-elimination is very important for the satisfaction of TAFE and the candidate.

### Statistical Data

One of the most important data about selection phases is statistical data. It can give an impression about the application of the stages. It can also give brief information about the importance and effects of each phase. Table 2 shows pass rate in each selection phases of civilian high school oriented candidates.

- Should we continue to use UEE scores or should we develop a special examination like AFOQT?
- How can we obtain more predictive tests, especially pilot aptitude tests?
- Can we use aptitude tests instead of expensive experimental flights?
- Should we use structured interviews?

### Conclusion

Candidates who apply for being a TAFE student join really complicated and carefully designed selection activities. During these activities the intelligence, personality factors, and pilot aptitudes



of candidates are examined several times and only the ones who could achieve all these can feel the proud to be students of the Academy.

Since 1911, TAF has insured the future of the country and has been going on with the duty of protecting it at all cost. To be able to realize this crucial duty, TAF has been using the highest technology and it has been selecting the pilots and officers being conscious of the importance that the personnel to use this technology should also be at the highest level.

In this way, TAF will be an important factor for the peace of world with the principal of Atatürk. "Peace at home, peace in the world".

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